

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings of claims in the application:

LISTING OF CLAIMS:

Claims 1-11 (cancelled)

12. (New) A modulator-integrated light source in which a semiconductor laser and an electroabsorption optical modulator are integrated on a high-resistance semiconductor substrate;

wherein said electroabsorption optical modulator has a pair of electrodes arranged on one surface of said high-resistance semiconductor substrate and a prescribed bias voltage is applied to said electrodes;

said electroabsorption optical modulator is of a configuration that satisfies a condition:

$$L \times B \geq 2000 \mu\text{m} \cdot \text{Gb/s}$$

where L is a length of said electroabsorption optical modulator and B is an operating frequency;

an absorption peak wavelength of said electroabsorption optical modulator being shorter than an oscillation wavelength of said semiconductor laser; and

the energy conversion value ΔX of a detuning amount, which is the difference between said oscillation wavelength and said absorption peak wavelength at room temperature, satisfies a condition:

$$40 \text{ meV} \leq \Delta X \leq 100 \text{ meV}.$$

13. (New) A modulator-integrated light source according to claim 12, wherein said prescribed bias voltage applied at a minimum operating temperature is 1 V or less.

14. (New) A modulator-integrated light source according to claim 12, wherein said pair of electrodes are a P-type electrode and an N-type electrode, and said P-type electrode is a traveling-wave electrode.

15. (New) A modulator-integrated light source according to claim 14, wherein an active layer of said electroabsorption optical modulator has an undoped layer and a thickness of said undoped layer gradually decreases with progression in a direction of progression of oscillation light from said semiconductor laser.

16. (New) A modulator-integrated light source according to claim 12, wherein active layers of said semiconductor laser and said electroabsorption optical modulator are composed of layers buried by a semiconductor or a dielectric.

17. (New) A modulator-integrated light source according to claim 16, wherein said buried layers are undoped layers.

18. (New) A modulator-integrated light source according to claim 12, wherein quantum wells of an active layer of said semiconductor laser and quantum wells of an active layer of said electroabsorption optical modulator are joined by a butt joint.

19. (New) A modulator-integrated light source according to claim 18, wherein the quantum wells of said electroabsorption optical modulator are of a structure wherein an energy level of a conductive band of wells is higher than an energy level of a conductive band of the barriers, and moreover, an energy level of a valence band of the wells is higher than an energy level of a valence band of the barriers.

20. (New) A modulator-integrated light source according to claim 12, wherein aluminum is contained in a composition of the active layer of said electroabsorption optical modulator.

21. (New) A fabrication method of a modulator-integrated light source in which a semiconductor laser and an electroabsorption optical modulator are integrated on a high-resistance semiconductor substrate; said fabrication method comprising the steps of:

growing an active layer having a first bandgap in a region that includes active layers of said semiconductor laser and said electroabsorption optical modulator;

removing, of the active layer formed in said growing step, the portion that corresponds to the region of the active layer of said electroabsorption optical modulator and using a remainder as the active layer of said semiconductor laser; and

growing an active layer having a second bandgap that differs from said first bandgap in a region that was removed in said removing step as the active layer of said electroabsorption optical modulator.